JCC:WAH:jws

good reference material for next time you write a RCD!

Washington DC 20530

September 13, 1991

Region III Philadelphia DC
sign off on [illegible]
that would require SOW

Fran Burns
Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Re: Review of 5 RODs

Dear Fran:

Enclosed are my annotated pages of the 5 RODs you sent me last week. I am certainly in no position to pass on the substance of these documents. I have only looked at the selected remedy sections and made suggestions that will make these documents more suitable to use as enforceable requirements under a consent decree. My comments are pretty cryptic [illegible] better call me after you have rece[illegible] them.

Here are some preliminary thoughts on how one can draft RODs that will form the basis of enforceable consent decrees. These are largely in addition to my earlier letter on this subject, a copy of which is enclosed.

1. Create one section within the ROD that sets forth as briefly as possible an enforceable description of the remedy and specification of requirements that must be met in its implementation. In this section,

   a) Use mandatory language (e.g., "shall" not "would").

   b) State each requirement briefly, clearly and only once.

   c) Where there are alternatives or contingencies, specify what will trigger the contingency and who (and on what basis) will select among alternatives.

d) Be self contained (i.e., write the section so it gives a complete set of requirements for the remedy without references to other parts of ROD).

e) Do not include explanation of why this particular remedy was chosen. This material is vital, but should be included in a different section.

2. Within the above-described remedy section, identify and briefly describe each component of the remedy (e.g., cap, pump and treat, groundwater monitoring, slurry wall, fence, institutional controls, etc.). For each element specify the following:

a) Spatial extent (e.g., what area must be capped? which areas of groundwater must be pumped and treated? at what point must cleanup standards be met?). Sometimes it will be possible to delineate these areas by metes and bounds or by marking specific areas or boundaries on a site map. In other cases, criteria for subsequently establishing the appropirate boundaries can be set (e.g., cap all soil contaminated with more than 10 ppm arsenic, pump and treat all groundwater contaminated with more than 10 ppm vinyl chloride).

b) ARARs. For each remedy component identify all ARARS.

c) Particulars of how the remedy is to be implemented. This is not, of course, the place or stage of the process at which to design the remedy. However, any specifics that EPA deems important regarding how the remedy is to be implemented should be set forth here. For example, if particular features of a cap, beyond the requirement of the RCRA reg (§ 204.310) that the cap leak less than the bottom of the landfill, are thought to be important, they should be specified here.

d) Performance Standards. For each remedy component, set forth one or more performance standards, that is, standards that define what that component must accomplish (e.g., the cap must have a permeability less than 10^{-7} cm/sec.; the pump and treat system must reduce the concentration of contaminants A, B and C below specified levels thought a delineated attainment area). The performance standards may or may not be ARARs. All ARARs are not performance standards, as many of them describe

how the remedy is to be implemented, not what it must achieve. The performance standards should be labelled as such, so a judge will know to what the consent decree refers when it uses that term.

e) O&M. For each remedy component, specify what O&M must be done and for how long.

I hope these thoughts are helpful. Thank you for the chance to go over these RODs.

Sincerely,

Assistant Attorney General
Environment and Natural Resources
Division

By: Bill

William A. Hutchins
Senior Attorney
Environmental Enforcement Section

cc: Marcia Mulkey
Neil Wise
William Early

DRAFTING ENFORCEABLE RODs AND STATEMENTS OF WORK

By: William A. Hutchins

Here are some thoughts on how to draft RODs and statements of work that will form the basis of enforceable consent decrees. The following points represent only the minimum and do not address such critical matters as how a ROD should be written or supported to enable it to survive arbitrary and capricious review.

I. General Drafting Suggestions

1. Create one self-contained document (or section) that sets forth as briefly as possible an enforceable description of the remedy and the requirements that must be met in its implementation. This document may be either a part of the ROD (probably the "Selected Remedy" section) or the statement of work or other appendix to the consent decree.[1] Write this document as if it were a set of regulations to govern the PRP's implementation of the remedy. If cross references to parts of the ROD are necessary, make them specific and unambiguous.

2. Use mandatory language ("shall" not "would" or "may"; "requirement" or "standard", not "goal").

3. Avoid describing the same requirement more than once. Repetition, particularly when different language is used each time, creates ambiguities.

4. For key concepts, such as the level to which groundwater must be cleaned, adopt one term (e.g., "groundwater cleanup levels") and use it consistently.

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[1] EPA Region III has adopted the goal of including the enforceable description of the remedy and related requirements in the ROD. Where the ROD contains such a description meeting the suggestions in this memorandum, I see no need for a separate consent decree appendix or statement of work. Eliminating the separate appendix streamlines the process of implementing the remedy through a consent decree, avoids ambiguities inherent in having two documents (the ROD and the separate appendix) which both describe the remedy, and reduces the ability and inclination of PRPs to negotiate about the remedy, because the ROD is a final, signed document when negotiations begin and there is no separate, non-final consent decree appendix about which to haggle.

5. Where a decision is deferred to later (e.g., treatment methodology or cleanup levels will be selected on basis of treatability studies done during design) specify that EPA will make these decisions and identify the criteria to be used (e.g., cleanup levels will be set to achieve a cancer risk of 10^{-X} at the site boundary).

6. Write in the active, not passive, voice. For example, avoid "B will be performed" or "D will be decided." Say "EPA will determine" and "Settlors shall perform."

7. Do not include in the enforceable remedy description explanation of why this particular remedy was chosen. This material is vital, but should be included in a different section of the ROD.

II. Content

Within the above-described remedy section, identify and briefly describe each component of the remedy (e.g., cap, pump and treat, groundwater monitoring, slurry wall, fence, institutional controls, etc.). For each component specify the following:

1. Spatial extent (e.g., what area must be capped? which areas of groundwater must be pumped and treated? at what point must cleanup standards be met?). Sometimes it will be possible to delineate these areas by metes and bounds or by marking specific areas or boundaries on a site map. In other cases, criteria for subsequently establishing the appropriate boundaries can be set (e.g., cap all soil contaminated with more than 10 ppm arsenic, pump and treat all groundwater contaminated with more than 10 ppm vinyl chloride).

2. ARARs. For each remedy component identify all ARARs.

3. Particulars of implementation. The ROD or Statement of Work is not the place to design the remedy. But frequently there are aspects of how the work is to be carried out that are critical to the success of the remedy. Such matters should be set forth.[2] In all cases we need some standard to

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[2] For example, if EPA concludes that a landfill must be covered with a multi-layer (e.g., soil, clay, sand, plastic membrane) cap, this requirement must be stated. A reference to

(continued...)

use in demonstrating to a judge, should the need arise, that a decision by EPA to reject or modify a PRP workplan is not arbitrary and capricious, but rather based on a reasoned judgment that the plan will not meet the requirements of the ROD or Statement of Work.

4. Performance Standards. For each remedy component, set forth one or more performance standards, that is, standards that define what that component must accomplish (e.g., the cap must have a permeability less than 10^{-7} cm/sec.; the pump and treat system must reduce the concentration of contaminants A, B and C below specified levels throughout a delineated attainment area). The performance standards may or may not be ARARs. All ARARs are not performance standards, as many of them describe how the remedy is to be implemented, not what it must achieve. The performance standards should be labelled as such, so a judge will know to what the consent decree refers when it uses that term (i.e., in the additional work section).

5. Means of demonstrating compliance. Specify for each performance standard how and at what point in space the Settlors are to demonstrate compliance.

6. O&M. For each remedy component, specify what O&M must be done and for how long.

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[2](...continued)
40 C.F.R. § 264.310 (the RCRA regulation on capping a landfill) will only require that the cap be less permeable than the bottom of the landfill. If the ROD and consent decree require only compliance with Section 204.310, a court is likely, in dispute resolution, to set aside an EPA decision that a multi-layer cap is required if the PRPs can show that a single layer of compacted dirt will be less permeable than the bottom of the landfill.

OLD CITY OF YORK

DRAFT

Each of the alternatives under consideration would be implementable at the Site using conventional construction practices. Alternatives 5, 6, and 7 may pose some implementation problems during construction of the multilayer cap due to the proximity of the Boser residence to Area #3.

COST

The lowest cost alternative (excluding the No Further Action Alternative) is Alternative 2 at $2,504,700. The highest cost alternative is Alternative 7 at approximately 26,000,000. The cost of the other alternatives considered are provided in the Summary of Alternatives section of the Proposed Plan.

STATE ACCEPTANCE

The Commonwealth of Pennsylvania has ---------- with the selected remedy.

COMMUNITY ACCEPTANCE

Community acceptance of the selected remedy will be evaluated after the public comment period ends and will be addressed in the ROD in the Responsiveness Summary.

I ASSUME YOU DON'T WANT A RCRA CAP OR MULTILAYER CAP

IX. SELECTED REMEDY

Based upon consideration of information available for the Old City of York Site, including the documents available in the administrative record file, an evaluation of the risks currently posed by the Site, the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has selected a modified combination of Alternative 3 and Alternative 7 as the remedy to be implemented at the Old City of York Site.

The selected remedy ~~provides for~~ SHALL INCLUDE THE FOLLOWING: (1) the restoration of the soil cover in the northeastern portion of refuse Area #3 to a two foot minimum (2) ground water recovery/treatment system in both Areas #1 and #3 (3) a landfill gas extraction system (4) vault sediment removal with offsite disposal, (5) and a ground water monitoring program. In addition, the selected remedy ~~would~~ include a perimeter fence at the leachate collection vaults to prevent public access, and a surface water/sediment monitoring program for the leachate seeps and tributaries onsite to ensure continued protection to human health and the environment. The final number and location of recovery wells for both Area #1 and #3 ~~would~~ be determined by EPA during the design phase of the project. If needed, additional wells or monitoring stations will be installed as part of the remedial action to ensure compliance goals of the selected remedy. The ground water extraction system will continue to operate until the remediation goal of background levels of contaminants is reached. The clean up level for the aquifer

SHALL

COULD

THESE 2 SENTENCES ARE INCONSISTENT

INCLUDE STANDARDS FOR EACH OF THE 5 ELEMENTS.
(1) CAP - ADD ANY ADDITIONAL REQUIREMENTS (i.e. MATERIALS, COMPACTION, GRADING, ETC) OR PERFORMANCE STANDARDS (i.e. PERMEABILITY ETC) FOR LINER)

(2) GROUND WATER PUMP + TREAT SHALL BE DESIGNED AND OPERATED TO ACHIEVE REDUCTION OF LEVELS OF CONTAMINANTS LISTED ON ____ TO THE LOWER OF (1) ----- OR (2) ..... --- THROUGHOUT [DESCRIBE AREA TO BE CLEANED]. IN PARTICULAR THERE SHALL BE A SUFFICIENT [redacted] NUMBER OF WELLS + THEY SHALL BE SO LOCATED THAT ALL GROUND WATER IN [AREA] CAN BE EFFECTIVELY TREATED AND THE SYSTEM SHALL BE OPERATED CONTINUOUSLY UNTIL SUCH LEVELS ARE REACHED THROUGHOUT [AREA].

(3) GAS EXTRACTION SYSTEM - SUFFICIENT TO DO WHAT

(4) VAULT REMOVAL - SPECIFY WHAT WILL BE DONE WITH WASTE (SIMILAR TO ARTC STATEMENT OF WORK)

(5) GROUND WATER MONITORING - SAY WHAT MONITORING FOR - HOW LONG - WHAT AREAS

(6) FENCE - HOW LONG MAINTENANCE ? WHO RESPONSIBLE ?

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contaminants are, for each contaminant, the lower of (1) the standards listed in Table 3 and (2) the background level of the contaminant. Background levels for each of the contaminants listed in Table 3 shall be the method detection limit for the method of analysis utilized with respect to that contaminant. As of the date of this Record of Decision, the appropriate methods of analysis are 40 C.F.R. Part 136 (Series 601 and 602), and 40 C,F.R. Part 141 (Series 524.2). If implementation of the selected remedy demonstrates, in corroboration with hydrogeological and chemical evidence, that it will be technically impracticable to achieve and maintain the remediation goals throughout the area of attainment, the EPA in consultation with the Commonwealth of Pennsylvania, will consider amending the ROD or issuing an Explanation of Significant Differences (ESD) to inform the public of alternative ground water goals. It is estimated that the cost of the selected remedy would be approximately $8,000,000.

Don't limit to alternative ground water levels

In compliance with NCP

SAY appropriate modifications

SAY requirement or clean up standard not goal

Remediation of these low level threats at the Old City of York Site will effectively eliminate the risks associated with potential exposure to contaminated ground water at the Site.

Consent decree must say what happens in this case

X. STATUTORY DETERMINATIONS

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA established several other statutory requirements and preferences. These specify that when complete, the selected remedial action for a site must comply with applicable or relevant and appropriate environmental standards established under Federal and State environmental laws unless a statutory waiver is granted. The selected remedy must also be cost-effective and utilize treatment technologies or resource recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes.

Protection of Human Health and the Environment

The selected remedy will be protective of human health and the environment by eliminating the threat posed by hazardous substances within the Old City of York Landfill. These hazardous substances currently pose a threat to human health due to potential exposure to ground water at the Site. Implementation of this remedy would effectively eliminate the potential risk to human health which may result from exposure to ground water from the Site and restore ground water at the Site to beneficial uses. The selected remedy would effectively minimize the potential for exposure to landfill refuse by restoring the soil cover in the northeastern portion of Area #3. The selected remedy would also

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Table 3

NO

REQUIRED Remediation ~~Goals~~ for Groundwater LEVELS

NO

COMPOUND (a)	~~TARGET~~ REQUIRED CONCENTRATION (ug/l)	
	VALUE	BASIS
BENZENE	5	MCL
CARBON TETRACHLORIDE	5	MCL
CHLOROFORM	13	RISK BASED (b,c)
1,4-DICHLOROBENZENE	75	MCL
TOTAL DICHLOROBENZENE	75	MCL (d)
1,1-DICHLOROETHANE	5	QUANTITATION LIMIT (e)
1,2-DICHLOROETHANE	5	MCL
1,1-DICHLOROETHENE	7	MCL
TRANS-1,2-DICHLOROETHENE	100	PMCL
1,2-DICHLOROETHENES (TOTAL)	70	PMCL (f)
METHYLENE CHLORIDE	11	RISK BASED (b)
TETRACHLOROETHENE	5	PMCL
TRICHLOROETHENE	5	MCL
VINYL CHLORIDE	2	MCL

REFER TO PAGE 28 OF THE RECORD OF DECISION FOR A COMPLETE DISCUSSION OF GROUNDWATER REMEDIATION GOALS FOR THIS SITE.

by the use of proper monitoring, operating procedures and personal protective gear.

Other short-term risks to onsite workers might occur during the removal of the vault sediment. Such risks are physical in nature, such as possible falls and potential accidents involved with equipment.

IMPLEMENTABILITY

Each of the alternatives under consideration would be implementable at the Site using conventional construction practices. Alternatives 5, 6, and 7 may pose some implementation problems during construction of the multilayer cap due to the proximity of the Boser residence to Area #3.

COST

The lowest cost alternative (excluding the No Further Action Alternative) is Alternative 2 at $2,504,700. The highest cost alternative is Alternative 7 at approximately $26,000,000. The cost of the other alternatives considered are provided in the Summary of Alternatives section of the ROD.

STATE ACCEPTANCE

The Commonwealth of Pennsylvania does not concur with the selected remedy.

COMMUNITY ACCEPTANCE

Community acceptance is assessed in the attached Responsiveness Summary. The Responsiveness Summary provides a thorough review of the public comments received on the RI/FS and the Proposed Plan, and EPA's responses to comments received.

IX. SELECTED REMEDY

Based upon consideration of information available for the Old City of York Landfill Site, including the documents available in the administrative record file, an evaluation of the risks currently posed by the Site, the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has selected a modified combination of Alternative 3 and Alternative 7 as the remedy to be implemented at the Old City of York Landfill Site.

The selected remedy shall include the following: (1) the restoration of the soil cover (see Figure 6) in the northeastern portion of refuse Area #3 to a two foot minimum; (2) installation of a diversion swale along South Road in the vicinity of the

Boser residence; (3) revegetation of the soil cover; (4) a ground water recovery/treatment system in both Areas #1 and #3 including 30-year ground water monitoring; (5) a landfill gas venting system in the vicinity of the Boser residence and installation of gas monitoring probes in the northeastern portion of refuse Area #3; and (6) vault sediment removal with offsite disposal at an EPA and PADER approved facility. In addition, the selected remedy would include a perimeter fence at the leachate collection vaults to prevent public access, and a surface water/sediment monitoring program for the leachate seeps and tributaries onsite to ensure continued protection to human health and the environment.

It is estimated that the present worth cost of the selected remedy will be approximately $8,000,000. In estimating the cost of the selected remedy, EPA used the present worth cost of Alternative 3 and the present worth cost of a similar ground water recovery/treatment project at a similar Superfund Site as a basis in estimating the present worth cost of the selected remedy (see Table 28 for a detailed capital cost summary).

Remediation of the low level threats at the Old City of York Landfill Site will effectively eliminate the risks associated with potential exposure to contaminated ground water at the Site.

Performance Standards

(1) Restoration of the Soil Cover

A uniform and compacted layer of soil shall be placed over the northeastern section of refuse Area #3 to restore the soil cover in this area to a two foot minimum. This soil cover shall (1) provide dermal protection from the refuse in the northeastern portion of Area #3; (2) be capable of supporting the germination of propagation of vegetative cover; and (3) compact well and not crack excessively when dry. The cover shall be maintained for 30 years.

(2) Installation of a Diversion Swale Along South Road

A diversion swale to control surface water run-on and run-off shall be constructed along South Road by the Boser residence to prevent erosion of the soil cover. The management of surface water and control of soil erosion shall be based on the 24-hour precipitation event in inches to be expected once in 25 years.

(3) Revegetation of the Restored Soil Cover

Vegetation shall be established on the restored soil cover in the northeastern portion of Area #3. Revegetation shall provide for an effective and permanent vegetative cover of the same seasonal variety as vegetation native to the Site and capable of self regeneration and plant succession. Revegetation

shall provide a quick germinating, fast-growing vegetative cover capable of stabilizing the soil surface from erosion. Mulch shall be applied to regraded areas where necessary to control erosion, promote germination of seeds and increase the moisture retention of soil.

(4) **Ground Water Recovery/Treatment System and Ground Water Monitoring**

Ground water recovery/treatment shall be conducted in both refuse Areas #1 and #3. The recovery wells shall be located within the contaminated plumes emanating from both refuse areas #1 and #3. The final number and location of recovery wells for both Area #1 and #3 shall be determined by EPA during the design phase of the project. The existing air stripper onsite shall be used to treat the recovered ground water. If needed, an additional air stripper and/or recovery wells or monitoring wells shall be installed as part of the remedial action to ensure compliance with the clean up levels of the selected remedy.

The ground water extraction system will continue to operate until the remediation to clean up levels of contaminants is reached throughout the area of attainment. The area of attainment shall encompass the area outside the boundary of Areas #1 and #3 and up to the boundary of the contaminant plumes. The clean up level for the aquifer contaminants are, for each contaminant, the lower of (1) the standards listed in Table 29 and (2) the background level of the contaminant. Background levels for each of the contaminants listed in Table 29 shall be the method detection limit for the method of analysis utilized with respect to that contaminant. The appropriate methods of analysis are 40 C.F.R. Part 136 (Series 601 and 602), and 40 C.F.R. Part 141 (Series 524.2). To this end, monitoring wells shall be sampled on a quarterly basis for at least 30-years. The number and location of these monitoring wells will be specified during the remedial design, and additional monitoring wells shall be installed, if required. If sampling confirms that background levels have been attained throughout the area of attainment and remain at the required levels for twelve consecutive quarters, operation of the extraction system can be suspended. If, subsequent to the extraction system shutdown, quarterly monitoring shows the ground water concentrations of any contaminant of concern to be above the levels specified in Table 29, the extraction system shall be restarted and continued until the levels in Table 29 have once more been attained for twelve consecutive quarters.

very important

All extracted ground water shall be treated to levels which will allow for discharge into Tributary D in compliance with the requirements of Federal and State discharge regulations. All emissions from the air stripper shall be in compliance with the Clean Air Act and the requirements of the Pennsylvania Air

Pollution Control Act promulgated at 25 Pa. Code Chapter 127..

It is estimated that it will take in excess of thirty years to achieve the ground water remdiation levels as specified in this ROD. If implementation of the selected remedy demonstrates, in corroboration with hydrogeological and chemical evidence, that it will be technically impracticable to achieve and maintain the remediation levels throughout the area of attainment, the EPA in consultation with the Commonwealth of Pennsylvania, will consider amending the ROD or issuing an Explanation of Significant Differences (ESD) to inform the public of alternative ground water clean up levels.

(5) Landfill Gas Venting System and Installation of Gas Probes

A landfill gas venting system shall be installed in the vicinity of the Boser residence to minimize the potential for landfill gas migration toward the Boser home. The number of gas vents shall be determined during the remedial design. The landfill gas venting system shall meet the requirements under 25 Pa. Code Chapter 127, and specifically Section 127.12(a)(5) for new air emission sources.

To monitor the potential occurence of landrill gas migration in the northeastern portion of Area #3, perimeter gas monitoring probes shall be installed the same time the soil cover is installed. These gas monitoring probes shall be tested quarterly for 30 years or until EPA determines that no gas monitoring is necessary.

(6) Vault Sediment Removal with Offsite Disposal

The accumulated sediment from the concrete collection vaults located at the West Seep shall be completely removed and disposed of at an offsite permitted facility. Prior to disposal, TCLP testing shall be conducted on the sediment. If the sediment fails the TCLP procedure, it shall be disposed of at an approved offsite RCRA Subtitle C facility. If the sediment passes the TCLP procedure, it may be disposed of at an EPA and PADER approved and permitted solid waste landfill. Sediment from the concrete collection vaults shall continue to be periodically removed when the vaults reach three quarters full.

(7) Construction of a Perimeter Fence

A perimeter fence shall be constructed around the concrete collection vaults located at the West Seep to prevent public access to the vaults. This fence shall be maintained for 30-years.

(8) Surface Water/Sediment Monitoring

Surface water (Streams and Seeps) and sediment (stream and seep) monitoring shall be conducted for 30 years. During the first five years, sampling shall be conducted semi-annually during base flow conditions. This data shall then be evaluated by EPA, in consultation with PADER, to determine if further surface water and sediment sampling is necessary for the next 25 years. Parameters to be monitored include, but are not limited to, the following: volatile organic compounds, semi-volatile organic compounds, TAL inorganics (metals), particle size, and leachate parameters.

In addition, the surface water/sediment monitoring program will include a fish and macrobenthic invertebrate study that shall be conducted once a year during the spring season for a five year period.

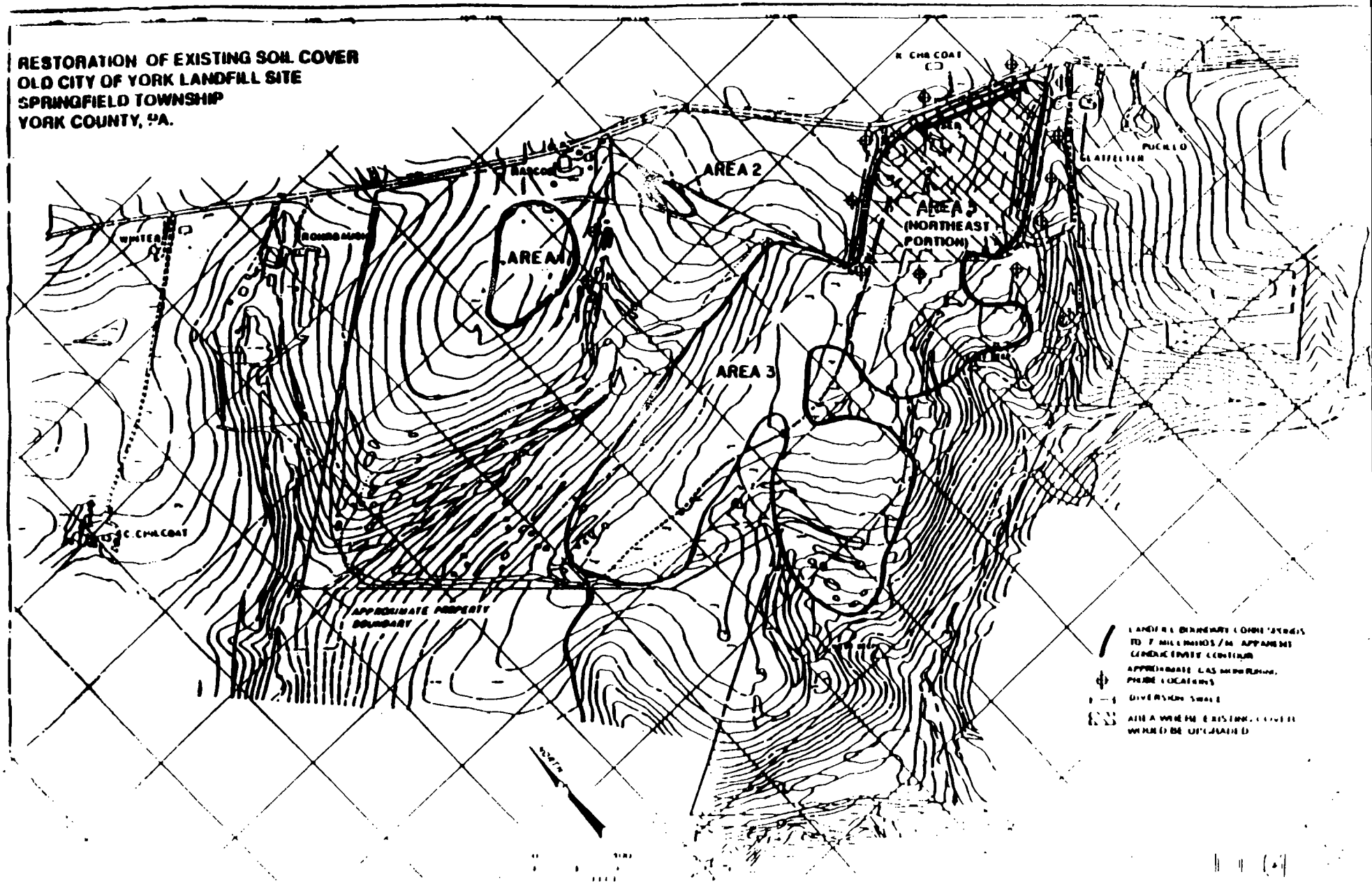
X. STATUTORY DETERMINATIONS

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA established several other statutory requirements and preferences. These specify that when complete, the selected remedial action for a site must comply with applicable or relevant and appropriate environmental standards established under Federal and State environmental laws unless a statutory waiver is granted. The selected remedy must also be cost-effective and utilize treatment technologies or resource recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes.

Protection of Human Health and the Environment

The selected remedy will be protective of human health and the environment by eliminating the threat posed by hazardous substances within the Old City of York Landfill. These hazardous substances currently pose a threat to human health due to potential exposure to ground water at the Site. Implementation of this remedy would effectively eliminate the potential risk to human health which may result from exposure to ground water from the Site and restore ground water at the Site to beneficial uses. The selected remedy would effectively minimize the potential for exposure to landfill refuse by restoring the soil cover in the northeastern portion of Area #3. The selected remedy would also eliminate the potential risk to aquatic organisms from a sudden discharge of sediment from the collection vaults at the West Seep. Because the selected remedy would result in hazardous substances remaining onsite, 5-year site reviews, pursuant to

FIGURE 6


RESTORATION OF EXISTING SOIL COVER
OLD CITY OF YORK LANDFILL SITE
SPRINGFIELD TOWNSHIP
YORK COUNTY, PA.
AREA 1
AREA 2
AREA 3
AREA 3
(NORTHEAST
PORTION)
APPROXIMATE PROPERTY
BOUNDARY
NORTH

performed to evaluate the effectiveness of the selected treatment technology. Any construction activities will have a short-term impact on the daily lives of the local residents, which will include inconvenience and the general disruption associated with earth work in a well established and populated area. GW-3 would also be readily implementable and would be disruptive to residents but not as significantly since it would not involve the installation of the collection drain. GW-2 is easily implementable.

Cost

To an extent, the cost associated with cleaning-up the site is driven by the presence of dioxin isomers in the ground water, which is currently being discharged to Naylors Run. Disposal options for the process residuals can be better characterized as part of the treatability study. The cost of implementing the preferred ground water collection and treatment option, GW-4, is between about 10 and 12 million dollars (present worth). The cost of alternative GW-3 is $7.5 to $9.7 million dollars. The cost of alternative GW-2 is $1.9 million dollars.

State Acceptance

The Commonwealth of Pennsylanaia has been involved in the review of the Remedial Investigation and Feasibility Study and is supportive and concurs on the selection of the interim remedy, alternative GW-4. The position of the Commonwealth on alternative GW-3 is that they prefer GW-4 to GW-3 and the Commonwealth would not support GW-2.

Community Acceptance

Community acceptance is more fully addressed in the attached Responsiveness Summary. The Responsiveness Summary provides a thorough review of the public comments received on the RI/FS, the Proposed Plan, and EPA's response to the comments received.

9. Selected Remedy

After careful consideration, the selected remedy for remediating the ground water contamination in the shallow aquifer shall be the construction of a treatment plant, in conjunction with planned treatability studies to optimize the effectiveness of the advanced oxidation process or the powdered activated carbon treatment. Under this remedy, GW-4, 2 free product recovery wells shall be installed at NWP, and a treatment plant shall be constructed to treat ground water through chemical precipitation, granulated activated carbon treatment, and either PACT or AOP treatment. Also to be installed shall be an underground

interceptor drain behind PCG to collect ground water and direct it to the existing oil/water separator. The plant is expected to operated for 30 years. All effluent from the oil/water separator shall be pumped to the proposed treatment plant after which it shall be discharged to Naylors Run. Improved access to the OWS also will be implemented and additional ground water wells shall be installed north and south of the underground interceptor pipe. Also, the existing ground water wells will be sampled for contaminants of concern twice a year. This action is alternative GW-4 and details are provided under "Performance Standards".

Performance Standards

A. Free Product Recovery from the Shallow Aquifer

Two free product recovery wells will be installed on or adjacent to NWP property in the vicinity of the 'hot spot' at well R-2. Each of the free product recovery wells will include a free product skimmer.

A floating skimmer will be provided to remove any free product which accumulates in the well. The skimmer will operate whenever there is accumulation of free product. The contaminated oil from the skimmer pump will discharge to a Free Product Storage tank at the NWP site. The Free Product Storage tank vent will be fitted with a disposable vapor phase carbon unit to control odors and air emissions from the tank.

B. Treatment by the Existing Oil/Water Separator (OWS)

The existing oil/water separator was sized to treat flows in the range of 0 to 100 gallons per minute. The flow from the storm sewer (in the shallow aquifer) will continue to be directed to the existing oil/water separator (OWS), prior to further treatment. The normal dry weather flow from the storm sewer has been determined to be less than approximately twenty-five gallons per minute (25 gpm).

design detail should be left open

The aqueous flow discharging from the OWS will then be pumped (using the 25 gpm aqueous phase pumping station) to a new treatment system, located on NWP property. Access to the OWS will be improved by obtaining access agreements to permit vehicular traffic or hand trucks. A gate will be provided at the entrance to the right-of-way to restrict use of the access road to authorized persons.

C. Free Product Recovery from the Existing Oil/Water Separator

Two free product skimmers will be installed in the OWS to remove free product from the OWS. The skimmer will operate whenever there is accumulation of free product in the OWS. The skimmers will discharge to a small day tank located near the OWS.

A free product transfer pump will pump the recovered oil to the Free Product Storage tank located at the NWP site. This approach will eliminate the need to move drums of recovered free product from the existing OWS through the residential neighborhood. The residual oils will be disposed of as K001 Wastes.

If necessary, appropriate chemicals (e.g. NaCl) can be metered into the day tank to break any emulsion in the free product. This may be necessary to allow pumping the recovered free product the 1,200 feet to the Free Product Storage tank.

The piping from the free product transfer pump to the Free Product Storage Tank will be double walled with provision for leak detection and periodic leak testing/monitoring.

D. Aqueous Phase Pumping Station

A submersible pumping station will be provided at the existing OWS to convey the collected ground water to a suitable treatment system. Installation of the pumping station will require extending an electrical service to power the pumps, system controls, and any desired alarm systems. Design pumping capacity depends on the actual dry weather flow of water in the storm sewer, and the instantaneous flow capacity of the selected treatment system. Each pump will have a capacity of approximately 25 gpm. Only one pump will be able to run at a time, i.e. the second pump will serve as a back-up. The system shall be provided with necessary features for explosion-proof operation.

E. Treatment Plant

The water treated by the OWS will be pumped to the treatment plant at the NWP site for removal of contaminants. The estimated chemical concentration for the treatment plant influent is shown on Table 16.

F. Chemical Precipitation (1st Stage of Treatment Plant)

The chemical precipitation system will treat the inorganics and will remove the settleable solids which will be present in the ground water. The system will remove iron, calcium, manganese, arsenic as well as chromium, cadmium and zinc from the waste stream. Removal of the iron, calcium and manganese is necessary for optimum performance of subsequent treatment processes. The system will have provision to add polymer to enhance removal of solids, and a gravity settling tank where the metals and solids will accumulate. This solids fraction will be collected in drums for disposal at a suitable facility.

Depending on the rate of formation of the solids, it is possible that a dewatering device will be installed to reduce the volume of waste solids, and to possibly allow the waste to be considered as a solid (rather than a liquid) waste. This solids fraction will primarily be iron and manganese precipitants, but may require special handling for disposal, since the solids could include adsorbed dioxin or other significant contaminant concentrations.

Treatability studies will be performed during the remedial design phase of the project to adequately characterize the necessary size, features, and disposal options of the chemical precipitation system.

G. Removal of Organics

Following removal of metals using chemical precipitation, a system will be provided for removal of organic compounds. Two treatment alternatives for organic compounds have been selected for evaluation. The two options are Powdered Activated Carbon Treatment (PACT) as shown in Figure 3, or an Advanced Oxidation Process (AOP), as shown in Figure 4. Either process would be followed by a Granular Activated Carbon (GAC) polishing step.

The actual treatment system selection will be determined during treatability tests for a few representative treatment technologies. The treatment systems to be evaluated are described as follows:

H. Powdered Activated Carbon Treatment with On-Site Carbon Regeneration

A proprietary powdered activated carbon treatment system (PACT) is capable of effectively removing the organic compounds in the ground water at this site. The combination of the powdered carbon and activated sludge in a continuously stirred tank reactor (CSTR) effectively captures the volatile and semi-volatile organic compounds onto the carbon/biomass solids matrix.

has nothing to do with selected remedy

The combined effect of the powdered carbon and activated sludge provides tolerance of shock-loads of any toxic organics. This will provide enhanced system performance with potential biodegradation of numerous organic compounds, after a period of accumulation to the influent organic compounds.

The PACT system will be tolerant of significant organics loadings, such as from any free product which is not captured by the oil/water separator. It is possible that a supplemental carbon source will be needed to provide an influent chemical

oxygen demand of approximately 150 mg COD/l. Inexpensive molasses is a commonly used carbon source for the activated sludge, which permits co-metabolism of recalcitrant organics.

A single batch-mode PACT unit will be provided to treat the flow. A flow equalization tank will be provided for the batch unit, to permit continuous operation of the collection system. Transfer pumps will be provided to fill the process tank in approximately 45 minutes.

If needed, on-site carbon regeneration can be provided by a wet air oxidation (WAO) system. On-site regeneration would be justified only if off-site disposal was not possible. The smallest WAO unit would be capable of treating a 5 gpm residual waste solids stream, and requires a thirty foot by forty foot utility building to house the unit.

The smallest WAO unit would have enough capacity to oxidize residuals from the PACT system, the GAC units, and the free product from the skimmers. The WAO process uses high pressure (2000 psi) and elevated temperature (540 'F) in a titanium reactor to regenerate the carbon, and can be operated to effectively destroy organic compounds such as PCP and dioxins. Treatability tests will determine whether the WAO system was needed at the NWP site.

I. Advanced Oxidation Process (AOP)

Advanced oxidation systems are a relatively new technology which have been shown to be capable of treating the volatile and semi-volatile compounds which are present in the ground water at the site. For instance, a system using UV light, combined with hydrogen peroxide and ozone will be able to destroy the compounds found in the ground water.

Ultraviolet oxidation is an advanced oxidation process that uses ultraviolet light with the addition of ozone and/or hydrogen peroxide. The resulting oxidative environment is significantly more destructive than the environment created with ozone or hydrogen peroxide by themselves or in combination.

An ultraviolet oxidation system consists of a stainless steel reactor with several stages, several UV lamps, an ozone generator, and a hydrogen peroxide feed system. The UV lamps are mounted vertically in the reactor and are enclosed in quartz tubes. Ozone enters each stage through a stainless steel diffuser. Hydrogen peroxide is metered into the reactor influent.

When the system is operated in the continuous mode, the

worth costs are shown in Table 8.

H. State Acceptance

The Pennsylvania DER concurs on EPA's selected remedy, Alternative 6.

I. Community Acceptance

A public meeting on the Proposed Plan was held August 13, 1991 in Hellertown, Pennsylvania. Comments received orally at the public meeting and in writing during the public comment period are referenced in the Responsiveness Summary attached to this Record of Decision. Residents of the Borough of Hellertown have not objected to the selected remedy. Champion Spark Plug Company has recommended that EPA select Alternative 2, the institutional controls alternative.

IX. SELECTED REMEDY: DESCRIPTION AND PERFORMANCE STANDARD(S) FOR EACH COMPONENT OF THE REMEDY

EPA has selected Alternative 6 as the remedy for the Hellertown Manufacturing Company Site. The selected remedy consists of the following components:

- -Placement of an impermeable cover over the entire former lagoon area;
- -Surface water runoff controls;
- -Extraction and treatment of groundwater (air stripping and solids removal) with discharge to Saucon Creek;
- -Long-term groundwater monitoring; and
- -Deed restrictions.

Each component of the remedy and its performance standard(s) will be described in turn.

A. Impermeable Cover

The former lagoon area encompasses 145,000 square feet or 3.5 acres. (See Figure 5). Former lagoons 1 and 5 are covered with an asphalt parking lot which has several noticeable cracks. Former lagoons 2, 3 and 4 are contiguous with the parking lot and are covered with soil.

As part of the selected remedy, an asphalt and clay impermeable cover shall be constructed over the entire former lagoon area. The portion which is now covered with asphalt shall be covered with a reinforcement layer and a new asphalt concrete cover. (The purpose

of the reinforcement layer is to minimize cracking of the asphalt concrete cover.) The portion of the former lagoon area which is now covered with soil shall be covered with a two-foot compacted clay cover or the equivalent, topsoil and grass. Both portions of the cover shall be designed to achieve a permeability of no more than 1 x 10^{-7} cm/sec, which shall constitute the Performance Standard. (This impermeable cover is not a RCRA cap and there are no ARARs that are applicable, relevant or appropriate.)

As discussed above, the clay and soil portion of the cover shall be designed to achieve a permeability of no more than 1 x 10^{-7} cm/sec. Asphalt concrete is a hot-mixed and hot-laid mixture of asphalt and graded aggregates which produces a harder, denser, and more resistant surface than paving asphalt. Permeabilities ranging from 1 x 10^{-5} cm/sec to 10^{-9} cm/sec can be achieved ("Lining of Waste Containment and Other Impoundment Facilities," EPA Document 600/2-88/052, September 1988). Thus, both the asphalt concrete and clay portions of the cover will achieve equivalent permeability.

In order to maintain the Performance Standard of no more than 1 x 10^{-7} cm/sec, routine inspection and maintenance of the impermeable cover shall be required until such time as EPA and Pennsylvania DER determine that the Performance Standard for each contaminant in the groundwater has been achieved to the extent technically practicable throughout the entire area of groundwater contamination (an estimated 30 to 40 years). Maintenance shall include repairs to the asphalt portion of the cover as necessary to correct cracks and the effects of settling, subsidence, erosion, etc., and the cultivation of natural vegetation (grasses and weeds) on the clay and topsoil portion of the cover to prevent erosion. Because the selected remedy will result in contaminants remaining on-site, 5-year Site reviews under Section 121(c) of CERCLA will be required.

B. Surface Water Runoff Controls

A storm water collection system consisting of catch basins and drain pipes shall be constructed for the asphalt parking lot and the entire former lagoon area. The Performance Standard for this system shall be that it effectively collects storm water from the parking lot and former lagoon areas and conveys it to an existing storm drainage pipe on the northern boundary of the Site. (There are no ARARs that are applicable, relevant or appropriate to this system.) In order to maintain the integrity and effectiveness of this storm water collection system, routine inspection and maintenance of the system shall be required until such time as EPA and the Pennsylvania DER determine that the Performance Standard for each contaminant in the groundwater has been achieved to the extent technically practicable throughout the entire area of groundwater contamination (an estimated 30 to 40 years).

C. Extraction and Treatment of Groundwater

The selected remedy includes groundwater extraction, treatment and

discharge, which shall be required until such time as EPA and the Pennsylvania DER determine that the Performance Standard for each contaminant in the groundwater has been achieved to the extent technically practicable throughout the entire area of groundwater contamination, both on-site and off-site (an estimated period of 30 to 40 years). (See Figure 4).

1. Groundwater Extraction and Treatment System

Groundwater shall be extracted using multiple extraction wells, the exact location and number of which shall be determined during the design of the groundwater recovery system. Recovered groundwater shall be treated using an on-site treatment system. Suspended solids shall be removed using solids settling in a settling tank or clarifier followed by an on-line filtration unit. The groundwater shall then be treated using a packed column airstripping unit. Final flow rates and air stripper dimensions will be determined during the remedial design. The treated effluent shall be discharged to Saucon Creek through a new outfall pipe that shall be constructed as part of the remedial action.

2. Performance Standards for Groundwater

The Performance Standard for each contaminant of concern in the groundwater shall be the MCL for that contaminant (the federal ARAR for public drinking water supplies under the Safe Drinking Water Act) or the background concentration of that contaminant (the Pennsylvania ARAR under 25 PA Code §§ 264.90 - 264.100), whichever is more stringent. The background concentration for each contaminant of concern shall be established in accordance with the procedures for groundwater monitoring outlined in 25 PA Code § 264.97 before groundwater treatment begins. In the event that a contaminant of concern is not detected in samples taken for the establishment of background concentrations, the detection limit for the method of analysis utilized with respect to that contaminant shall constitute the "background" concentration of the contaminant.

The MCLs for benzene, trichloroethylene, and vinyl chloride are set forth at 40 C.F.R. § 141.61. The MCLs for tetrachloroethylene, trans-1,2-dichloroethylene, and cis-1,2-dichloroethylene were published in the Federal Register at 56 Fed. Reg. 3593 on January 30, 1991. The MCLs, detection limits and appropriate analytical detection methods for these contaminants of concern are listed below:

Contaminant	MCL(ug/l)	Detection Limit (ug/l)	Method
Benzene	5	0.20	601,602
Tetrachloroethylene	5	0.03	601,602
Trichloroethylene	5	0.12	601,602
Vinyl Chloride	2	0.18	601,602
Dichloroethylene (trans-1,2-)	100	0.10	601,602
Dichloroethylene (cis-1,2-)	70	0.12	524.2

[1]Method 601/602 is found at 40 C.F.R. Part 136
Method 524.2 is found at 40 C.F.R. Part 141

1. ARAR Requirements Which Shall Be Met for Groundwater

The following ARARs shall be met, in addition to the federal and state ARARs discussed under "Performance Standards," above, for each contaminant of concern in the groundwater.

Since the treated groundwater will be discharged to Saucon Creek, NPDES requirements and state water quality criteria under the Pennsylvania Clean Streams Law are applicable. During the design of the groundwater treatment system, specific discharge criteria will be established by Pennsylvania DER as set forth in 25 PA Code §§ 93.1 - 93.9.

Emissions from the air stripping tower, including benzene and vinyl chloride, shall be monitored and, if required, a vapor phase carbon adsorption or thermal destruction unit shall be installed to ensure compliance with Section 112 of the Clean Air Act, 42 U.S.C § 7412 National Emission Standard for Hazardous Air Pollutants (NESHAPs). The relevant and appropriate NESHAP for benzene is set forth at 40 C.F.R. Part 61, Subpart L, and the relevant and appropriate NESHAP for vinyl chloride is set forth at 40 C.F.R. Part 61, Subpart F. During design of the air stripping unit, the Pennsylvania DER will determine from actual design flow rates and VOC loading rates whether emission controls need to be installed.

The removal of suspended solids in a settling tank will result in the generation of small quantities of residual solids requiring disposal. The exact quantity will vary with treatment flow rates. These residual solids shall be tested to determine if they are a RCRA hazardous waste. If they are, the RCRA storage and transportation requirements for off-site disposal of these wastes (40 CFR Parts 262-264), and the Department of Transportation Rules for Hazardous Materials Transport (49 CFR Parts 107 and 171-179), shall be met.

During all site work, Occupational Safety and Health Administration (OSHA) standards set forth at 29 CFR Parts 1910, 1926 and 1904 governing worker safety during hazardous waste operations, shall be

met.

4. Groundwater Remedy Implementation

During the conduct of the RI/FS, EPA identified several springs (or seeps) along Saucon Creek in the vicinity of the Site. It could not be determined if there is a hydraulic connection between groundwater on-site and the discharge of the springs. During the remedial design period additional field work shall be conducted to determine if these springs/seeps are a groundwater pathway for discharge of contaminants to Saucon Creek. The springs/seeps may discharge high levels of contaminants to Saucon Creek and may pose a risk either to users of the creek or to persons or animals who come into direct contact with the seeps. The design and construction of the groundwater pump and treatment system shall be coordinated with this investigation so that design and implementation schedules are compatible. If necessary, a program to remediate the discharge from the springs may be required. In that event, EPA will issue an Explanation of Significant Differences.

The wetland area adjacent to Saucon Creek is potentially affected by the migration of contaminants through groundwater discharge. Surface water in the wetlands area contained inorganic compounds and metals - in particular, elevated levels of zinc. Sediments contained metals and PAH compounds. The results of the sampling survey in the RI/FS were inconclusive in determining whether contaminants are present in the wetland area above background levels and whether the wetland area receives contaminants from groundwater discharge or through storm drainage, or a combination of both. Additional wetland soil, stream, sediment, and surface water sampling will be required as part of the remedial design study. If necessary, a program to remediate the wetland area may be required. In that event, EPA will issue an Explanation of Significant Differences.

An operation and maintenance plan for the groundwater extraction and treatment system shall be required. The performance of the groundwater extraction and treatment system shall be carefully monitored on a regular basis and the system may be modified, as warranted by the performance data collected during operation. These modifications may include, for example, alternate pumping of extraction wells or the addition or elimination of certain extraction wells.

It may become apparent during implementation or operation of the groundwater extraction system and its modifications, that contaminant levels have ceased to decline and are remaining constant at levels higher than the Performance Standards over some portion of the contaminated plume. If EPA and the Commonwealth of Pennsylvania determine that implementation of the selected remedy demonstrates, in corroboration with hydrogeological and chemical evidence, that it will be technically impracticable to achieve and

maintain the Performance Standards throughout the entire area of groundwater contamination, EPA and the Pennsylvania DER may require that any or all of the following measures be taken, for an indefinite period of time, as further modification(s) of the existing system:

1) long-term gradient control may be provided by low level pumping, as a containment measure;

2) chemical-specific ARARs may be waived for those portions of the aquifer for which EPA and Pennsylvania DER determine that it is technically impracticable to achieve further contaminant reduction;

3) institutional controls may be provided/maintained to restrict access to those portions of the aquifer where contaminants remain above Performance Standards; and

4) remedial technologies for groundwater restoration may be re-evaluated.

The decision to invoke any or all of these measures may be made during the 5-year reviews of the remedial action. If such a decision is made, EPA will amend the ROD or issue an Explanation of Significant Differences.

D) Long-Term Groundwater Monitoring

A long-term groundwater monitoring program shall be implemented to evaluate the effectiveness of the groundwater pumping and treatment system. Monitoring wells shall be installed in the area of groundwater contamination and sampled for an estimated 30 to 40 years, until such time as EPA and the Pennsylvania DER determine that the Performance Standard for each contaminant of concern has been achieved to the extent technically practicable throughout the entire area of groundwater contamination. The number and location of these monitoring wells shall be specified in the design of the extraction system. Sampling shall be on a quarterly basis for the first two years and on a semi-annual basis thereafter.

An operation and maintenance plan for the groundwater monitoring system shall be required.

E) Deed Restrictions

As soon as practicable, restrictions shall be placed in the deed to the Site to prohibit (1) excavation of contaminated soils; and (2) the use of on-site groundwater for domestic purposes, including drinking water. The continuing need for these restrictions will be re-evaluated during the 5-year Site reviews under Section 121(c) of CERCLA.